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Ethiopian Education Network to Support Agricultural Transformation (EENSAT)

**Course Title: Application of the Water and Food Security Toolbox - Ethiopia
Course Guide**

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Open Course Ware





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1. Introduction

The purpose of this course is to provide participants with the background and knowledge necessary to use and apply environmental data currently delivered through satellite based communication systems as well as freely available relevant information which can be retrieved from online internet resources.

The WFS-Ethiopia Toolbox provides an open and flexible integrated solution to manage the EUMETCast-GEONETCast data stream, data derived from internet resources, etc. and import of the various image types and data products and bring them together in a common GIS and RS environment for further processing.

The main objective of the Toolbox is to allow the user, who operates a EUMETCast – GEONETCast ground receiving station to easily manage the incoming data stream and to import the data into a common freeware GIS-RS environment for further analysis, in this case using the functionality of ILWIS version 3.7.2 or higher. This toolbox version allows import of various data sources relevant for water and food security analysis for Ethiopia through a Graphical User Interface (GUI).

The data disseminated by EUMETCast-GEONETCast is consisting of various formats. Over time a number of utilities have been developed at ITC to be able to import these data types. Also other existing freeware utilities are used and have been integrated in the toolbox, such as BUFR and GRIB (2) decoders. Also use can be made of other available software routines, such as Panoply, for data visualization. Furthermore attention was given to use data that is made freely available through the World Wide Web. A number of routines are available to incorporate relevant environmental, long term climatological and forecasting information in this manner, extending the functionality beyond the EUMETCast-GEONETCast direct reception. To be able to use these routines internet connectivity is required. The data is automatically retrieved and pre-processed.

The table below shows the overall course curriculum. During the first lesson further background information is provided on ILWIS and the Water and Food Security - Ethiopia Toolbox plug-in. Instructions are provided to conduct the installation and download the other necessary sample data and to configure the EUMETCast / GEONETCast reception settings. Furthermore additional information is presented on the open WFS-Ethiopia Toolbox design.

Lesson 2 is providing further background information on the data and products received and those selected which can be processed using the toolbox utilities available.

Lesson 3 is consisting of exercises applying the (sample) data received through EUMETCast – GEONETCast and applications developed to process the data received from a number of Geostationary and Polar Orbiting Satellites.

Lesson 4 is exploring a number of relevant satellite derived products for Ethiopia, relevant for Water and Food Security analysis.

Total course duration is 40 hours, guidance by the lecturer will be for 6 weeks as from the start of the course. This entails that an average weekly effort of about 6 to 7 hours is expected to conduct the course. By the end of the course, an assignment is provided and if well evaluated, a certificate of attendance will be

provided.

Table 1: Course Curriculum

Main topic	Sub topic(s)	Type of study material	Study load (hours)
Course description	Overall course guide (this document)	Document	2
Lesson 1: Introduction to the Water and Food Security Toolbox	<ul style="list-style-type: none"> Introduction to the Water and Food Security Ethiopia Toolbox Installation of the WFS-Toolbox (manual, chapter 1.1) Review of the WFS-Toolbox Architecture (manual, chapter 2) Retrieving and organizing the exercise data (manual, Annex 2) 	PPT WFS-Ethiopia Manual	6
Lesson 2: Exploring relevant data for Water and Food Security	<ul style="list-style-type: none"> Data processing capability of the WFS-Ethiopia Toolbox (manual, chapter 3) 	WFS-Ethiopia Manual and links to www	6
Lesson 3: Processing observations from satellites	<ul style="list-style-type: none"> Geostationary satellites (manual, chapter 4.1) Polar Orbiting satellites, example METOP-AVHRR (manual, additional exercise chapter 4.16.7) 	WFS-Ethiopia Manual Exercises and links to www	10
Lesson 4: Working with satellite derived products from Ethiopia	<ul style="list-style-type: none"> MPEF (manual, chapter 4.2) LSA-SAF (manual, chapter 4.3) Proba Vegetation (manual, chapter 4.8) 	WFS-Ethiopia Manual Exercise description	12
Assignment	<ul style="list-style-type: none"> Retrieving statistical information for Basin Management (manual, chapter 4.16.6) 	WFS-Ethiopia Manual - Assignment description	4

2. Prerequisites

To conduct the course, the following prerequisites are expected from the participants:

- Online access and ability to use ftp client - Filezilla (<https://filezilla-project.org/>)
- Working knowledge of GIS
- Advantage when having participated in the following EENSAT courses:
 - EUMETCast for African Users
 - Free and open source tools for GI-Science - GDAL, QGIS and ILWIS 386

The course is set-up in such a way that there is no need to be online all the time. You can download the

documents, exercise descriptions, software tools used as well as the data-sets, the study of the materials and to conduct the assignments can be done off-line. For upload of your results you should be online again. For eventual questions, you can also use the email address provided of the lecturer.

In order to ensure successful completion, please adhere to the overall course schedule as indicated in the final chapter of this course guide

3. Overall course schedule

As from the start of course please take into consideration the expected progress for the duration of the course, to ensure successful completion. Please plan your time schedule over the next 6 weeks in such a way that you can adhere to this proposed schedule.

Week 1	Week 1	Week 2	Week 2	Week 3
Study course guide and start with lesson 1	Lesson 1	Lesson 2	Lesson 2 and start Lesson 3	Lesson 3
Week 3	Week 4	Week 4	Week 5	Week 6
Lesson 3	Lesson 4	Lesson 4	Lesson 4	Assignment

Note: Each block is considered to be approx. 4 hours

During and after completion of the course the exercise results (total of 1 assignment for lesson 4) should be uploaded into the LMS.